This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

Claim 1 (original): A method for detecting an endpoint during a chemical mechanical polishing (CMP) process, comprising the operations of:

receiving a reflected spectrum data sample comprising a plurality of values corresponding to a plurality of spectrums of light reflected from an illuminated portion of a surface of a wafer;

extrapolating outside spectrum data using a linear combination of the values of the reflected spectrum data sample; and

determining an endpoint based on optical interference occurring in the reflected spectrum data.

Claim 2 (original): A method as recited in claim 1, further comprising the operation of decomposing the reflected spectrum data sample into noise sub-space values and signal sub-space values.

Claim 3 (original): A method as recited in claim 2, wherein the reflected spectrum data sample is decomposed using a singular value decomposition.

Claim 4 (original): A method as recited in claim 3, further comprising the operation of truncating the noise sub-space values.

Claim 5 (original): A method as recited in claim 1, wherein the optical interference is a result of phase differences in light reflected from different layers of the wafer.

Claim 6 (original): A method as recited in claim 5, wherein the optical interference occurs when a top metal layer is reduced to a thin metal zone.

Claim 7 (original): A method as recited in claim 6, further comprising the operation of determining when oscillations occur in a plot of wave-numbers based on the reflected spectrum data.

Claim 8 (original): A method as recited in claim 7, wherein the endpoint occurs when the oscillations in the plot of wave-numbers occurs.

Claim 9 (original): A method as recited in claim 8, further comprising the operation of obtaining linear prediction power data in a defined spectral range based on the wave-numbers.

Claim 10 (original): A method as recited in claim 9, further comprising the operation of calculating a sum of peak magnitudes occurring in the linear prediction power data.

Claim 11 (original): A method as recited in claim 10, further comprising the operation of selecting an endpoint when the sum of the peak magnitudes exceeds a predetermined threshold.

Claim 12 (currently amended): An endpoint detection apparatus for detecting an endpoint during a chemical mechanical polishing process, comprising:

a broad band light source for illuminating a portion of a surface of a wafer;

an optical detector for receiving reflected spectrum data sample comprising a plurality of values corresponding to a plurality of spectrums of light reflected from the illuminated portion of the surface of the wafer;

logic that ~~extrapolating~~ extrapolates outside spectrum data using a linear combination of the values of the reflected spectrum data sample; and

logic that determines an endpoint based on optical interference occurring in the reflected spectrum data.

Claim 13 (original): An endpoint detection apparatus as recited in claim 12, further comprising logic that decomposes the reflected spectrum data sample into noise sub-space values and signal sub-space values.

Claim 14 (original): An endpoint detection apparatus as recited in claim 13, wherein the reflected spectrum data sample is decomposed using a singular value decomposition.

Claim 15 (original): An endpoint detection apparatus as recited in claim 14, further comprising logic that truncates the noise sub-space values.

Claim 16 (original): A method for detecting an endpoint during a chemical mechanical polishing (CMP) process, comprising the operations of:

receiving a reflected spectrum data sample comprising a plurality of values corresponding to a plurality of spectrums of light reflected from an illuminated portion of a surface of a wafer;

decomposing the reflected spectrum data sample into noise sub-space values and signal sub-space values;

truncating the noise sub-space values;

extrapolating outside spectrum data using a linear combination of the values of the reflected spectrum data sample; and

determining an endpoint based on optical interference occurring in the reflected spectrum data.

Claim 17 (original): A method as recited in claim 16, wherein the reflected spectrum data sample is decomposed using a singular value decomposition.

Claim 18 (original): A method as recited in claim 17, wherein the optical interference is a result of phase differences in light reflected from different layers of the wafer.

Claim 19 (original): A method as recited in claim 18, further comprising the operation of determining when oscillations occur in a plot of wave-numbers based on the reflected spectrum data.

Claim 20 (original): A method as recited in claim 19, wherein the endpoint occurs when the oscillations in the plot of wave-numbers occurs.